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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,663	10/30/2007	Eduardo Diaz Del Rio Perez	576391-2003	3780

7590 08/26/2009  
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New York, NY 10116-8477

EXAMINER
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VONCH, JEFFREY A

ART UNIT	PAPER NUMBER
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1794

MAIL DATE	DELIVERY MODE
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08/26/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary****Application No.**

10/553,663

**Applicant(s)**

DIAZ DEL RIO PEREZ, EDUARDO

**Examiner**

Jeff A. Vonch

**Art Unit**

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☒ Claim(s) 1-15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 November 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_

**DETAILED ACTION**

***Claim Objections***

1. Claims 1-15 are objected to because of the following informalities: Regarding claims 1, 5, 9, and 13-15, the heat conductivity does not have any units of temperature (°C or K, most likely). The remaining claims (2-4, 6-8, & 10-12) are objected to as they are dependent on claims 1, 5, or 9. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Regarding claims 1, 5, 9, and 13-15, how the relation of surface area per unit volume of the application and the contact surface of the flammable fluids contained in the containing vessel is indefinite. What is claimed is a ratio of area per unit volume to total surface area. This gives a ratio with units of 1/volume. Was this intended? Also the definition of “unit” in “unit volume” was never established. Is it cubed meters, centimeters, feet, or possibly more abstract?

5. Claims 2-4, 6-8, and 10-12 are all dependent on one of the above rejected claims are indefinite for that reason.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-2, 4-6, 8-10, & 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gass (U.S. Patent No. 5,000,336) (hereinafter "Gass").

8. Gass teaches an explosion inhibiting article of manufacture (abstract) comprising a treated foil strip (apertured sheet material) (Fig. 3 & abstract) with at least one row of a plurality of polygonal (honeycombs) apertures being irregular (col. 5, lines 4-14 & claim 1) with respect to at least one adjacent polygonal aperture. Gass states that this treated foil strip has a large dissipation area and excellent heat conductivity (col. 5, lines 46-60). Gass does not teach a surface area per unit volume of application of at least about 2,000 times the contact surface of flammable fluids contained in a containing vessel or a heat conductivity of at least 0.025 Cal/cm-sec 10.46 W/m-K).

9. However, Gass teaches an aluminum foil and aluminum has a ~250 W/m-K (*0.6 Cal/cm-s-K*), far above the heat conductivity claimed. (In fact, most, if not all, metals have a heat conductivity above 10.46 W/m-K).

10. Gass also teaches that a high surface area in comparison to the amount of fluid contained in the vessel and container volume (contact surface of the flammable fluids in a containing vessel) (col. 3, lines 12-15 & col. 5, lines 51-60). It would have been obvious to a person of ordinary skill in the art at the time of invention desiring a high surface area to have a ratio of surface area per unit volume of application of at least 2,000 times the contact surface of flammable fluids contained in a containing vessel. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re*

*Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). One of ordinary skill in the art would have been motivated to have a large surface area so that heat could dissipate more effectively and quickly over a substantial contact area.

11. Regarding claim 2, Gass teaches the inner peripheral length of at least one of said apertures is unequal to the inner peripheral length of at least one adjacent aperture (Fig. 3 & col. 5, lines 4-8).

12. In the event Gass does not teach the difference in inner peripheral length of adjacent apertures, irregular apertures are taught to prevent “lumping together” of materials (the articles stacking into a corner of the tank) (col. 3, lines 6-15). It would have been obvious to one of ordinary skill in the art to standardize the irregularity of a structure, if it were desired. One of ordinary skill in the art would be motivated to have difference in inner peripheral length of adjacent apertures to cause irregularity in the material which would prevent “caking” and opening areas of a container to explosion (col. 2, lines 52-68 – col. 3, lines 1-6).

13. Regarding claim 4, Gass does not teach an article with a compressive yield of not more than 10%. However, Gass teaches that the articles keep a natural stability caused by the irregular apertures (col. 5, lines 22-23 & col. 6, lines 9-15). It would have been obvious to one of ordinary skill in the art desiring stability to form an article with a compressive yield of not more than 10%. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). One of ordinary skill in the art would have been motivated to form an article with a compressive yield of not more than 10% because the resulting natural stability would not open

up areas of the container to explosion (col. 3, lines 20-25) and give consistent coverage in all operating conditions (col. 3, lines 34-39).

14. Regarding claim 5, the rejection is equivalent to claim 1 (see above), except that the apertured sheet material in claim 1 has been formed into an article of generally spheroidal shape. Gass teaches the treated foil strip to have any number of shapes, one being a sphere (col. 5, lines 61-62 & Fig. 6).

15. Regarding claims 6 and 8, the rejections are equivalent to claims 2 and 4, respectively (see above) with the sphere from claim 5 incorporated into the design.

16. Regarding claim 9, the rejection is equivalent to claim 1 (see above), except that the apertured sheet material in claim 1 has been formed into an article of generally cylindrical shape. Gass teaches the treated foil strip to have any number of shapes, one being a cylinder (col. 5, lines 61-62 & Fig. 5).

17. Regarding claims 10 and 12, the rejections are equivalent to claims 2 and 4, respectively (see above) with the cylinder from claim 9 incorporated into the design.

18. Regarding claim 13, the rejection is equivalent to a combination of the rejections of claims 1 and 4 (see above).

19. Regarding claim 14, the rejection is equivalent to a combination of the rejections of claims 5 and 8 (see above).

20. Regarding claim 15, the rejection is equivalent to a combination of the rejections of claims 9 and 12 (see above).

21. Claims 1-2, 4-6, 8-10, & 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gass (U.S. Patent No. 5,000,336) (hereinafter "Gass") and further in view of Alhamad (U.S. Patent No. 5,794,706) (hereinafter "Alhamad").

22. Regarding claims 1-2, 4-6, 8-10, and 12-15, Gass teaches the structure as claimed or it would have been obvious given the disclosure. Although a large area for heat dissipation is desired, Gass does not teach surface area per unit volume of application of at least about 2,000 times the contact surface of flammable fluids contained in a containing vessel.

23. In the event that a surface area per unit volume of application of at least about 2,000 times the contact surface of flammable fluids contained in the containing vessel is not taught, Alhamad teaches an explosion-inhibiting article (abstract) that has a surface area per unit volume of 250 to 325 ft<sup>2</sup> per ft<sup>3</sup> (8.2 - 10.7 m<sup>2</sup>/m<sup>3</sup>) (col. 6, lines 50-51). Although this is not taught in relation to a contact surface of flammable fluids contained in a spherical containing vessel (the inner surface of the vessel), one could imagine a vessel that has a surface area of 0.1625 ft<sup>2</sup>, which is 2,000 times smaller than 325 ft<sup>2</sup> per ft<sup>3</sup>. Gass does calculate the volume percentage of the container that their explosion-inhibiting articles consume to be 2-3% (col. 5, lines 46-50) so a relation between the surface area of the container to the surface area per unit volume of the article would not be outside the reach of one of ordinary skill in the art. It would have been obvious to one of ordinary skill in the art at the time of invention to develop a surface area per unit volume of application of at least about 2,000 times the contact surface of flammable fluids contained in a containing vessel. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). One of ordinary skill in the art would be motivated to

develop the claimed relationship to maintain a high heat dissipation area in reference to the flammable liquid contained within a vessel (Gass; col. 5, lines 51-60) and to provide flame arresting properties for excluding oxygen and hydrogen (Alhamad; col. 3, lines 8-14).

24. Claims 3, 7, & 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gass (U.S. Patent No. 5,000,336) (hereinafter "Gass") as applied to claims 1, 5, & 9 above, and further in view of Mondt et al. (U.S. Patent No. 5,246,130) (hereinafter "Mondt").

25. Gass teaches an explosion-inhibiting article comprising a treated foil strip (apertured sheet material) (as applied to claim 1). Gass also teaches this sheet material to be the shape of a sphere and a cylinder (as applied to claims 5 & 9, respectively). See above Section 103

Rejections. Gass does not teach a density of  $2.8 - 19.5 \text{ g/cm}^3$ .

26. Regarding claim 3, Mondt teaches a stainless steel mesh (col. 2, lines 7-9) used to prevent explosions (abstract & col. 1, lines 15-17). Stainless steel has a density of  $7.86 \text{ g/cm}^3$ . It would have been obvious to one of ordinary skill in the art at the time of invention to change the material used based on need as Gass allowed for any material with good heat conductivity, which would encompass most metals (see above Section 103 Rejection). One of ordinary skill in the art would be motivated to use stainless steel in order to control ignition of methanol (col. 1, lines 15-17).

27. Regarding claim 7, the rejection is equivalent to claims 3 (see above) with the sphere from claim 5 incorporated into the design.

28. Regarding claim 11, the rejection is equivalent to claim 3 (see above) with the cylinder from claim 9 incorporated into the design.



29. Claims 4, 8, & 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gass (U.S. Patent No. 5,000,336) (hereinafter "Gass") as applied to claims 1, 5, & 9 above, and further in view of Szego (U.S. Patent No. 3,356,256) (hereinafter "Szego").

30. Gass teaches an explosion-inhibiting article comprising a treated foil strip (apertured sheet material) (as applied to claim 1). Gass also teaches this sheet material to be the shape of a sphere and a cylinder (as applied to claims 5 & 9, respectively). See above Section 103 Rejections. Gass teaches irregular apertures for a stable mesh but does not teach a compressive yield of not more than 10%.

31. Regarding claims 4 and 13, Szego teaches integrally-connected, highly heat-conductive ribbons (apertured sheet material) that prevents explosions (col. 1, lines 20-28). Szego teaches that the material should be stiff and should strongly resist crushing and compression (col. 1, lines 53-59). It would have been obvious to one of ordinary skill in the art at the time of invention to apply the compression resistance to Gass's desire for a stable structure (see above Section 103 Rejections). One of ordinary skill in the art would have been motivated to provide a low compressive yield (below 10%) to prevent crushing in containment (col. 5, lines 44-55) and to provide stability and support for itself (col. 5, lines 65-70) both of which prevent the opening of voids in the filler potentially causing an explosion (col. 5, lines 56-65).

32. Regarding claims 8 and 14, the rejections are equivalent to claims 4 and 13, respectively (see above) with the sphere from claim 5 incorporated into the design.

33. Regarding claims 12 and 15, the rejections are equivalent to claims 4 and 13, respectively (see above) with the cylinder from claim 9 incorporated into the design.

***Conclusion***

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff A. Vonch whose telephone number is (571) 270-1134. The examiner can normally be reached on Monday to Thursday 8:30-6:00 EST.
35. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571) 272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
36. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Supervisory Patent Examiner, Art Unit 1794

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August 13<sup>th</sup>, 2009